Erroneous shock by an AED: Importance of obtaining AED tracing to prevent inappropriate ICD implantation

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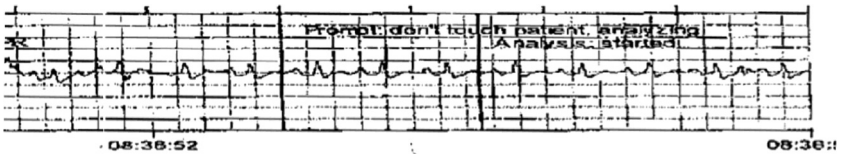

Figure 1 Automated external defibrillator rhythm analysis performed during sinus tachycardia.

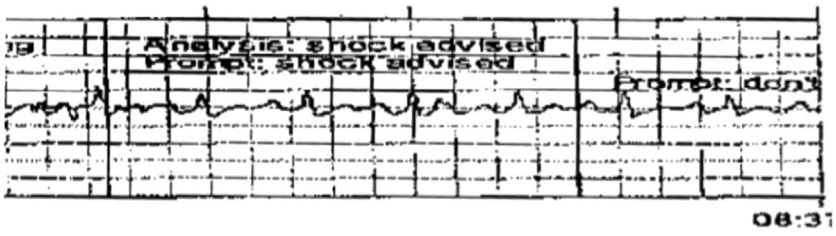

Figure 2 Automated external defibrillator interpretation of sinus tachycardia as a shockable ventricular arrhythmia, with shock advised.

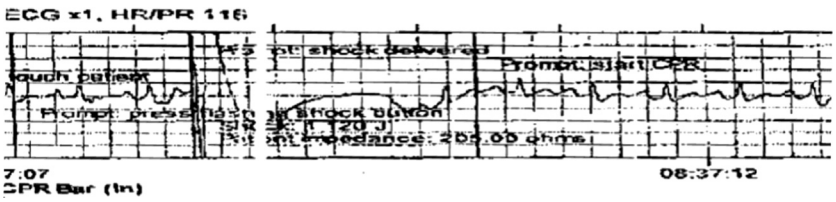

Figure 3 Delivery of 120 J external shock during sinus tachycardia, with continued sinus tachycardia in the immediate postshock period.

Introduction

Automated external defibrillators (AEDs) are life saving for cardiac arrest victims. These devices do not rely on individual interpretation of arrhythmias, but rather have automated detection algorithms. These detection algorithms are thought to be quite accurate.[1-3] We describe a case in which an AED incorrectly diagnosed sinus rhythm as a shockable rhythm.

KEYWORDS Automated external defibrillator; Cardiac arrest; Ventricular fibrillation; Implantable cardioverter-defibrillator; Nonresponsive

ABBREVIATIONS **AED** = automated external defibrillator; **EMS** = emergency medical service (Heart Rhythm Case Reports 2015;1:62–63)

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Case Reports

A 56-year-old morbidly obese woman with no history of cardiac disease was found on her bedroom floor by her family. She had been feeling poorly after several days of cough and fatigue. The family called the emergency medical service (EMS). When EMS personnel arrived, they found the patient nonresponsive and without a palpable pulse. Chest compressions were initiated, and an automated external defibrillator was used. During automated rhythm analysis (Figure 1), a shock was advised (Figure 2) and promptly

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KEY TEACHING POINTS

- Although automated external defibrillators (AEDs) are generally quite accurate, they are not always correct in their diagnosis. Accuracy rates of AEDs are >99% but not 100%.
- Original AED tracings from a patient with cardiac arrest should be evaluated. The emergency medical service should provide these tracings to the treating physicians.
- Unresponsiveness is not equivalent to a cardiac arrest. Unresponsiveness may be due to low blood pressure in other conditions such as sepsis and severe hypoxia. A pulse may even be nonpalpable in these conditions.

delivered (Figure 3), which awakened the patient. The patient was then admitted to our facility's medical intensive care unit, where she was diagnosed with *Klebsiella* pneumonia and was successfully treated over an uneventful 2-week course. An echocardiogram demonstrated a normal heart, and she had no arrhythmias during her hospital course.

A cardiac electrophysiologist was consulted for the implantation of an implantable cardioverter-defibrillator for cardiac arrest successfully resuscitated by using an AED. The rhythm strip from the AED was not available initially, but after several days of calls to the EMS it was finally obtained. A review of the rhythm strip from the AED used during the event revealed an incorrect interpretation of sinus tachycardia as a ventricular arrhythmia, for which a shock was advised and delivered. This shock presumably awakened the patient. Although previous studies evaluating AED accuracy in rhythm identification have revealed >99% specificity for shockable rhythms,[1–3] this case demonstrates the importance of obtaining and reviewing AED rhythm strips before proceeding with implantable cardioverter-defibrillator implantation. To our knowledge, this is the first reported case of an AED calling for a shock in which there was normal sinus rhythm on the AED tracing.

References

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